



#25

SEQUENCE LISTING

<110> Gruys, Kenneth James
Mitsky, Timothy Albert
Kishore, Ganesh Murthy
Slater, Steven Charles
Padgett, Stephen Rogers
Stark, David Martin

<120> Methods of Optimizing Substrate Pools and Biosynthesis of Poly-beta-hydroxybutyrate-co-poly-beta-hydroxyvalerate in Bacteria and Plants

<130> 11899.0155.DVUS02 (MOBT:155--3)

<140> US 09/942,891

<141> 2001-08-30

<150> US 09/313,123

<151> 1999-05-17

<150> US 08/673,388

<151> 1996-06-28

<150> US 08/628,039

<151> 1996-04-04

<150> US 08/614,877

<151> 1996-03-13

<160> 11

<170> PatentIn version 3.1

<210> 1

<211> 1545

<212> DNA

<213> Escherichia coli

<400> 1

atggctgact cgcaaccct gtccggtgct ccggaagggtg ccgaatattt aagagcagtg 60

ctgcgcgcgc cggtttacga ggcggcgag gttacgccgc tacaaaaaat ggaaaaactg 120

tcgtcgcgtc ttgataacgt cattctggtg aagcgcgaag atcgccagcc agtgcacagc 180

tttaagctgc gcggcgcata cgccatgatg gcgggctga cggaagaaca gaaagcgac 240

ggcgtgatca ctgcttctgc gggtaaccac gcgcagggcg tcgcgttttc ttctgcgcgg 300

ttaggcgtga aggcctgat cgttatgcca accgccaccg ccgacatcaa agtcgaccgg 360

ctgcgcggct tcggcggcga agtgctgctc cacggcgaga actttgatga agcgaaacgc 420

aaagcgatcg aactgtcaca gcagcagggg ttcacctggg tgccgccgtt cgaccatccg 480

atggtgattg ccgggcaagg cacgctggcg ctggaactgc tccagcagga cgcccatctc 540

gaccgcgtat ttgtgccagt cggcggcggc ggtctggctg cttgcgtggc ggtgctgac	600
aaacaactga tgccgcaaat caaagtgate gccgtagaag cggaagactc cgctgcctg	660
aaagcagcgc tggatgcggg tcatccggtt gatctgccgc gcgtagggct atttgctgaa	720
ggcgtagcgg taaaacgcat cggtgacgaa accttcggtt tatgccagga gtatctcgac	780
gacatcatca ccgtcgatag cgatgcgate tgtgcggcga tgaaggattt attcgaagat	840
gtgcgcgcgg tggcggaacc ctctggcgcg ctggcgctgg cggaatgaa aaaatatatc	900
gccctgcaca acattcgcg cgaacggctg gcgcatattc ttcccggtgc caacgtgaac	960
ttccacggcc tgcgctacgt ctcagaacgc tgcgaactgg tcgaacagcg tgaagcgttg	1020
ttggcggtga ccattccgga agaaaaaggc agcttctca aattctgcca actgcttggc	1080
gggcgttcgg tcaccgagtt caactaccgt tttgccgatg ccaaaaacgc ctgcatcttt	1140
gtcgggtgtgc gcctgagccg cggcctcgaa gagcgcaaag aaattttgca gatgctcaac	1200
gacggcggt acagcgtggt tgatctctcc gacgacgaaa tggcgaagct acacgtgcgc	1260
tatatggtcg gcggacgtcc atcgcatccg ttgcaggaac gcctctacag cttcgaattc	1320
ccggaatcac cgggcgcgct gctgcgcttc ctcaacacgc tgggtacgta ctggaacatt	1380
tctttgttcc actatcgag ccattggcacc gactacgggc gcgtactggc ggcgttcgaa	1440
cttggcgacc atgaaccgga tttcgaaacc cggctgaatg agctgggcta cgattgccac	1500
gacgaaacca ataaccggc gttcagggtt ttttggcggt gttaa	1545

<210> 2
 <211> 46
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 2	
tttttggatc cgatatctta acccgccaaa aagaacctga acgccg	46

<210> 3
 <211> 37
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 3

tttttggatc catggtgac tgcgaacccc tgtccgg 37

<210> 4
 <211> 44
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 4
 cagcttcgag ttcccgggaat caccggggcgc gttcctgcgc ttcc 44

<210> 5
 <211> 1545
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 5
 atggctgact cgcaaccctt gtccggtgct ccggaagggtg ccgaatatatt aagagcagtg 60
 ctgcgcgcgc cggttttacga ggcgggcgcag gttacgcgcg tacaataaat ggaaaaactg 120
 tcgtcgcgtc ttgataacgt cattctgggtg aagcgcgaag atcgccagcc agtgcacagc 180
 ttttaagctgc gcggcgcata cgccatgatg gcggggcctga ccgaagaaca gaaagcgcac 240
 ggcgtgatca ctgcttctgc gggtaaccac gcgcagggcg tcgcgttttc ttctgcgcgg 300
 ttaggcgtga aggcctgat cgttatgcc aaccgccaccg ccgacatcaa agtcgaccgg 360
 ctgcgcgggt tcggcggcga agtgcgtgct caccggcgcga actttgatga agcgaaacgc 420
 aaagcgatcg aactgtcaca gcagcagggg ttcaacctggg tgccgcggtt cgaccatccg 480
 atggtgattg ccgggcaagg cacgctggcg ctggaactgc tccagcagga cgcctatctc 540
 gaccgcgtat ttgtgccagt cggcggcggc ggtctggctg cttgcgtggc ggtgctgac 600
 aaacaactga tgccgcaaat caaagtgate gccgtagaag ccgaagactc cgctgcctg 660
 aaagcagcgc tggatgcggg tcatccggtt gatctgcgc gcgtagggct atttgcgtgaa 720
 ggcgtagcgg taaaacgcat cggtgacgaa accttcggtt tatgccagga gtatctcgac 780
 gacatcatca ccgtcgatag cgatgcgac tgtgcggcga tgaaggattt attcgaagat 840
 gtgcgcgcgg tggcgggaacc ctctggcgcg ctggcgtgg cgggaatgaa aaaatatatc 900
 gccctgcaca acattcgcgg cgaacggctg gcgcatatcc tttccggtgc caacgtgaac 960
 ttccacggcc tgcgctacgt ctcagaacgc tgcgaactgg tcgaacagcg tgaagcgttg 1020

ttggcggtga ccattccgga agaaaaaggc agcttctca aattctgcca actgcttggc	1080
gggcggttcgg tcaccgagtt caactaccgt tttgccgatg ccaaaaacgc ctgcatcttt	1140
gtcgggtgtgc gcctgagccg cggcctcgaa gagcgcaaag aaattttgca gatgctcaac	1200
gacggcggtt acagcgtggt tgatctctcc gacgacgaaa tggcgaagct acacgtgcg	1260
tatatggtcg gcggacgtcc atcgcatccg ttgcaggaac gcctctacag cttcgagtcc	1320
ccggaatcac cgggcgcgtt cctgcgcttc ctcaacacgc tgggtacgta ctggaacatt	1380
tctttgttcc actatcgag ccattggcacc gactacgggc gcgtactggc ggcgttcgaa	1440
cttggcgacc atgaaccgga tttcgaaacc cggctgaatg agctgggcta cgattgccac	1500
gacgaaacca ataaccggc gttcaggttc tttttggcgg gttaa	1545

<210> 6
 <211> 65
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 6	
tatcgagcc acggcaccga ctacgggcgc gtactggcgg cgttcgaatt tggcgaccat	60
gaacc	65

<210> 7
 <211> 1545
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 7	
atggctgact cgcaaccct gtccggtgct ccggaagggt ccgaatattt aagagcagtg	60
ctgcgcgcgc cggtttacga ggcggcgcag gttacgccgc tacaaaaaat ggaaaaactg	120
tcgtcgcgtc ttgataacgt cattctggtg aagcgcgaag atcgccagcc agtgcacagc	180
tttaagctgc gcggcgcata cgccatgatg gcgggcctga cggagaaca gaaagcgcac	240
ggcgtgatca ctgcttctgc gggtaaccac gcgcagggcg tcgcgttttc ttctgcgcgg	300
ttaggcgtga aggcctgat cgttatgcca accgccaccg ccgacatcaa agtcgaccgg	360
ctgcgcggct tcggcggcga agtgctgctc cagggcgcga actttgatga agcgaaacgc	420

aaagcgatcg aactgtcaca g'cagcagggg ttcacctggg tgccgccggt cgaccatccg	480
atggtgattg cggggcaagg cacgctggcg ctggaactgc tccagcagga cgcccatctc	540
gaccgcgtat ttgtgccagt cggcgggcggc ggtctggctg cttgcgtggc ggtgctgac	600
aaacaactga tgccgcaaat caaagtgatc gccgtagaag cggaagactc cgcctgcctg	660
aaagcagcgc tggatgcggg tcatccggtt gatctgccgc gcgtagggct atttgctgaa	720
ggcgtagcgg taaaacgcac cggtgacgaa accttcggtt tatgccagga gtatctcgac	780
gacatcatca ccgtcgatag cgatgcgatc tgtgcggcga tgaaggattt attcgaagat	840
gtgcgcgcgg tggcggaacc ctctggcgcg ctggcgctgg cggaatgaa aaaatatatc	900
gccctgcaca acattcgcg cgaacggctg gcgcatattc tttccggtgc caacgtgaac	960
ttccacggcc tgcgctacgt ctccagaacgc tgcgaactgg tcgaacagcg tgaagcggtg	1020
ttggcggtga ccattccgga agaaaaaggc agcttctctca aattctgcc actgcttggc	1080
gggcgttcgg tcaccgagtt caactaccgt tttgccgatg ccaaaaacgc ctgcatcttt	1140
gtcgggtgtgc gcctgagccg cggcctcgaa gagcgcaaag aaattttgca gatgctcaac	1200
gacggcggct acagcgtggt tgatctctcc gacgacgaaa tggcgaagct acacgtgcgc	1260
tatatggtcg gcggacgtcc atcgcatccg ttgcaggaac gcctctacag cttcgaattc	1320
ccggaatcac cgggcgcgct gctgcgcttc ctcaacacgc tgggtacgta ctggaacatt	1380
tctttgttcc actatcgag ccacggcacc gactacgggc gcgtactggc ggcgttcgaa	1440
tttggcgacc atgaaccgga tttcgaaacc cggtgaatg agctgggcta cgattgccac	1500
gacgaaacca ataaccggc gttcaggttc tttttggcgg gttaa	1545

<210> 8
 <211> 1545
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 8	
atggctgact cgcaaccctt gtccggtgct ccggaagggt ccgaatattt aagagcagtg	60
ctgcgcgcgc cggtttacga ggcggcgcag gttacgccgc tacaaaaaat ggaaaaactg	120
tcgtcgcgtc ttgataacgt cattctggtg aagcgcgaag atcgccagcc agtgcacagc	180
tttaagctgc gcggcgcata cgccatgatg gcgggcctga cggaagaaca gaaagcgcac	240
ggcgtgatca ctgcttctgc gggtaaccac gcgcagggcg tcgcgttttc ttctgcgcgg	300

ttaggcgtga aggccctgat cgttatgcca accgccaccg cgcacatcaa agtcgaccgg	360
ctgcgcggct tcggcggcga agtgctgctc cacggcgcgga actttgatga agcgaaacgc	420
aaagcgatcg aactgtcaca gcagcagggg ttcacctggg tgccgccgtt cgaccatccg	480
atggtgattg ccgggcaagg cacgctggcg ctggaactgc tccagcagga cgcccatctc	540
gaccgcgtat ttgtgccagt cggcgggcggc ggtctggctg cttgcgtggc ggtgctgac	600
aaacaactga tgccgcaaat caaagtgate gccgtagaag cggaagactc cgcttgctg	660
aaagcagcgc tggatgcggg tcatccggtt gatctgccgc gcgtagggct atttgctgaa	720
ggcgtagcgg taaaacgcat cggtgacgaa accttcggtt tatgccagga gtatctcgac	780
gacatcatca ccgtcgatag cgatgcgate tgtgcggcga tgaaggattt attcgaagat	840
gtgcgcgcgg tggcggaacc ctctggcgcg ctggcgctgg cgggaatgaa aaaatatatc	900
gccctgcaca acattcgcg cgaacggctg gcgcataatc tttccggtgc caacgtgaac	960
ttccacggcc tgcgctacgt ctcagaacgc tgcgaactgg tcgaacagcg tgaagcgttg	1020
ttggcggtga ccattccgga agaaaaaggc agcttcctca aattctgcca actgcttggc	1080
gggcgttcgg tcaccgagtt caactaccgt tttgccgatg ccaaaaacgc ctgcatcttt	1140
gtcgggtgtgc gcctgagccg cggcctcgaa gagcgcaaag aaattttgca gatgctcaac	1200
gacggcggct acagcgtggt tgatctctcc gacgacgaaa tggcgaagct acacgtgcgc	1260
tatatggtcg gcggacgtcc atcgcatccg ttgcaggaa cgcctctacag cttcgagtcc	1320
ccggaatcac cgggcgcggt cctgcgcttc ctcaacacgc tgggtacgta ctggaacatt	1380
tctttgttcc actatcgag ccacggcacc gactacgggc gcgtactggc ggcgttcgaa	1440
tttggcgacc atgaaccgga tttcgaaacc cggctgaatg agctgggcta cgattgccac	1500
gacgaaacca ataaccggc gttcaggttc tttttggcgg gttaa	1545

<210> 9
 <211> 1185
 <212> DNA
 <213> *Alcaligenes eutrophus*

<400> 9	
atgacgcgtg aagtggtagt ggtaagcggg gtccgtaccg cgatcgggac ctttggcggc	60
agcctgaagg atgtggcacc ggcgagctg ggcgcactgg tgggtgcgca ggcgctggcg	120
cgcgcgcagg tgtcgggcga cgatgtcggc cacgtggtat tcggcaacgt gatccagacc	180

gagccgcgcg acatgtatct gggccgcgtc gcggccgtca acggcggggt gacgatcaac 240
 gccccgcgcg tgaccgtgaa ccgcctgtgc ggctcggggc tgcaggccat tgtcagcgcc 300
 gcgcagacca tctgtctggg cgataccgac gtcgccatcg gcggcggcgc ggaaagcatg 360
 agccgcgcac cgtacctggc gccggcagcg cgctggggcg cacgcatggg cgacgccggc 420
 ctggtcgaca tgatgctggg tgcgctgcac gatcccttcc atcgcatcca catgggcgtg 480
 accgccgaga atgtcgccaa ggaatacgac atctcgcgcg cgcagcagga cgaggccgcg 540
 ctggaatcgc accgccgcgc ttcggcagcg atcaaggccg gctacttcaa ggaccagatc 600
 gtcccgggtg tgagcaaggg ccgcaagggc gacgtgacct tcgacaccga cgagcacgtg 660
 cgccatgacg ccaccatcga cgacatgacc aagctcaggc cggctcttct caaggaaaac 720
 ggcacgggtc cggccggcaa tgcctcgggc ctgaacgacg ccgccgcgcg ggtggtgatg 780
 atggagcgcg ccgaagccga gcgcgcgggc ctgaagccgc tggcccgcct ggtgtcgtac 840
 ggccatgccg gcgtggaccc gaaggccatg ggcacggcc cggtgccggc gacgaagatc 900
 gcgctggagc gcgcgggcct gcaggtgtcg gacctggacg tgatcgaagc caacgaagcc 960
 tttgccgcac aggcgctgcg cgtgaccaag gcgctcggtc tggaccgggc caaggttaac 1020
 ccgaacggct cgggcatctc gctggggccac ccgatcggcg ccaccgggtg cctgatcacg 1080
 gtgaaggcgc tgcattagct gaaccgcgtg cagggccgct acgcgctggt gacgatgtgc 1140
 atcggcggcg ggcaggccat tgccgccatc ttcgagcgta tctga 1185

<210> 10
 <211> 15
 <212> PRT
 <213> *Alcaligenes eutrophus*

<400> 10

Thr Arg Glu Val Val Val Val Ser Gly Val Arg Thr Ala Ile Gly
 1 5 10 15

<210> 11
 <211> 394
 <212> PRT
 <213> *Alcaligenes eutrophus*

<400> 11

Met Thr Arg Glu Val Val Val Val Ser Gly Val Arg Thr Ala Ile Gly
 1 5 10 15

Thr Phe Gly Gly Ser Leu Lys Asp Val Ala Pro Ala Glu Leu Gly Ala
 20 25 30

Leu Val Val Arg Glu Ala Leu Ala Arg Ala Gln Val Ser Gly Asp Asp
 35 40 45

Val Gly His Val Val Phe Gly Asn Val Ile Gln Thr Glu Pro Arg Asp
 50 55 60

Met Tyr Leu Gly Arg Val Ala Ala Val Asn Gly Gly Val Thr Ile Asn
 65 70 75 80

Ala Pro Ala Leu Thr Val Asn Arg Leu Cys Gly Ser Gly Leu Gln Ala
 85 90 95

Ile Val Ser Ala Ala Gln Thr Ile Leu Leu Gly Asp Thr Asp Val Ala
 100 105 110

Ile Gly Gly Gly Ala Glu Ser Met Ser Arg Ala Pro Tyr Leu Ala Pro
 115 120 125

Ala Ala Arg Trp Gly Ala Arg Met Gly Asp Ala Gly Leu Val Asp Met
 130 135 140

Met Leu Gly Ala Leu His Asp Pro Phe His Arg Ile His Met Gly Val
 145 150 155 160

Thr Ala Glu Asn Val Ala Lys Glu Tyr Asp Ile Ser Arg Ala Gln Gln
 165 170 175

Asp Glu Ala Ala Leu Glu Ser His Arg Arg Ala Ser Ala Ala Ile Lys
 180 185 190

Ala Gly Tyr Phe Lys Asp Gln Ile Val Pro Val Val Ser Lys Gly Arg
 195 200 205

Lys Gly Asp Val Thr Phe Asp Thr Asp Glu His Val Arg His Asp Ala
 210 215 220

Thr Ile Asp Asp Met Thr Lys Leu Arg Pro Val Phe Val Lys Glu Asn
 225 230 235 240

Gly Thr Val Thr Ala Gly Asn Ala Ser Gly Leu Asn Asp Ala Ala Ala

245

250

255

Ala Val Val Met Met Glu Arg Ala Glu Ala Glu Arg Arg Gly Leu Lys
260 265 270

Pro Leu Ala Arg Leu Val Ser Tyr Gly His Ala Gly Val Asp Pro Lys
275 280 285

Ala Met Gly Ile Gly Pro Val Pro Ala Thr Lys Ile Ala Leu Glu Arg
290 295 300

Ala Gly Leu Gln Val Ser Asp Leu Asp Val Ile Glu Ala Asn Glu Ala
305 310 315 320

Phe Ala Ala Gln Ala Cys Ala Val Thr Lys Ala Leu Gly Leu Asp Pro
325 330 335

Ala Lys Val Asn Pro Asn Gly Ser Gly Ile Ser Leu Gly His Pro Ile
340 345 350

Gly Ala Thr Gly Ala Leu Ile Thr Val Lys Ala Leu His Glu Leu Asn
355 360 365

Arg Val Gln Gly Arg Tyr Ala Leu Val Thr Met Cys Ile Gly Gly Gly
370 375 380

Gln Gly Ile Ala Ala Ile Phe Glu Arg Ile
385 390